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## Memo

*DATE:* December 10, 2004

*TO:* RHIC E-Coolers

*FROM:* Ady Herscovitch

*SUBJECT:* **Minutes of the December 10, 2004 Meeting**

Present: Ilan Ben-Zvi, Andrew Burrill, Peter Cameron, Xiangyun Chang, Alexei Fedotov, Ady Herscovitch, Animesh Jain, Dmitry Kayran, Jorg Kewisch, Vladimir Litvinenko, William Mackay, Thomas Roser, Triveni Srinivasan-Rao, Gang Wang (SUNY Stony Brook).

Topics discussed: Experiments at CELSIUS, PAC, Computations and Simulations, Superconducting Solenoid.

**Experiments at CELSIUS:** tomorrow Alexei and Vladimir are headed to Uppsala Sweden to perform a series of experiments at CELSIUS. In answer to Thomas' question regarding the planned experiments, Alexei gave a description of the purpose of the experiments. Advantage can be taken from the large energy range in proton energy (40 MeV to 480 MeV) that is available at CELSIUS to study scaling laws. The experiments are designed to determine the following:

1. Measure longitudinal cooling force and determine which formulas are better for use in magnetized cooling. This is to be done performing a clean set of experiments to compare the model of Parkhomchuk versus the model of Derbenev, Skrinsky and Meshkov, which is for infinite magnetic field. Right now it seems that the Parkhomchuk model has somewhat better agreement with experimental data.
2. Study transverse cooling rates of coherent and incoherent cooling.
3. Measurements of time evolution of energy distribution functions at conditions that are at about the equilibrium between cooling and IBS.

**PAC:** today is the deadline for abstract submission to PAC05. About 15 RHIC electron beam cooling related papers will be submitted by members of the group as well as a couple of papers in collaboration with Bruhwiler and Abell from Tech-X.

**Computations and Simulations:** Jorg reported that he has worked on trying to match the now highly magnetized electron beam into the solenoid entrance. There is a large emittance increase due to space charge interaction with the highly magnetized electrons. As next step, he plans to follow Ilan's suggestion to transport the beam through an asymmetric arc.

Vladimir reported that non-magnetized electron beam cooling seems promising, but show a limitation due to recombinations (10% beam loss in about 2 hours). Next step is to explore

the use of a 10 – 15 Gauss wiggler that can sufficiently increase transverse temperature to reduce recombinations without magnetizing the electron beam.

**Superconducting Solenoid:** Animesh described the current status of the 30 meter long solenoid as being made of two 15-meter long sections with a 1 – 2 inch gap between them. After an ensuing discussion, it appears that the gap can be reduced to within 1 centimeter. This is considered important to reduce the magnetization without impacting the Coulomb logarithm.